

What is claimed is:

1. (amendment) A permanent magnet field small DC motor comprising: an arc-shaped permanent magnet fixed in a soft-magnetic frame, wherein

said magnet is provided with an outer surface at both ends in a thrust direction that fits along an inner surface of said soft-magnetic frame, and a certain region in a middle part in the thrust direction of said magnet at both ends in the circumferential direction where said soft-magnetic frame does not function as a back yoke.

2. (amendment) The permanent magnet field small DC motor of claim 1, wherein a pair of arc-shaped permanent magnets opposing to each other are disposed in the soft-magnetic frame with the outer surfaces at both ends in the thrust direction fitting along the inner surface of the soft-magnetic frame, and fixed at both ends in the circumferential direction using a spring.

3. (amendment) The permanent magnet field small DC motor of claim 2, wherein the arc-shaped permanent magnets are compression molded from rare earth iron based melt-spun flakes and a binder.

4. (amendment) The permanent magnet field small DC motor of claim 2, wherein a maximum thickness of the arc-shaped magnets are 1 mm or less.

5. (amendment) The permanent magnet field small DC motor of claim 1, wherein a certain air-gap is provided between the outer surface of the arc-shaped permanent magnet in the middle part in the thrust direction at both ends in the circumferential direction and the soft-magnetic frame.

6. (amendment) The permanent magnet field small DC motor of claim 3, wherein a curvature of the outer surfaces of the arc-shaped rare earth magnets in the middle part in the thrust direction is made to be different from that of an outer surface at both ends in a thrust direction in a compression mold so that the soft-magnetic frame does not function as a back yoke at the region of

the outer surface in the middle part in the thrust direction at both ends in the circumferential direction.

7. (amendment) The permanent magnet field small DC motor of claim 1, wherein a pair of arc-shaped rare earth magnets opposing to each other fixed along the inner surface of said soft-magnetic frame exhibits different demagnetization curves at least by unsaturated magnetization.

8. (amendment) The permanent magnet field small DC motor of claim 5, wherein a distribution of flux density in the gap with the armature iron core is controlled by once magnetizing a pair of arc-shaped rare earth magnets opposing to each other fixed along the inner surface of soft-magnetic frame and then providing an initial demagnetization by heat so that a rate of demagnetization increases along with a distance from a center of a magnetic pole towards the ends in the circumferential direction, eventually making the demagnetization rate reaching the greatest at the air-gap formed between the middle part of the outer surface in the thrust direction at both ends in the circumferential direction and the soft-magnetic frame.

9. (amendment) An optical pickup device comprising the permanent magnetic field small DC motor of claim 1.